

University of Montana

ScholarWorks at University of Montana

Undergraduate Theses and Professional Papers

2019

Barriers to Implementing a Single-Use Plastic Bag Ban in Missoula

Tess Elizabeth Parker

University of Montana, Missoula, tp110451@umconnect.umt.edu

Follow this and additional works at: <https://scholarworks.umt.edu/utpp>



Part of the [Organizational Communication Commons](#), and the [Public Relations and Advertising Commons](#)

Let us know how access to this document benefits you.

Recommended Citation

Parker, Tess Elizabeth, "Barriers to Implementing a Single-Use Plastic Bag Ban in Missoula" (2019). *Undergraduate Theses and Professional Papers*. 256.
<https://scholarworks.umt.edu/utpp/256>

This Thesis is brought to you for free and open access by ScholarWorks at University of Montana. It has been accepted for inclusion in Undergraduate Theses and Professional Papers by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.

Barriers to Implementing a Single-Use Plastic Bag Ban in Missoula

Tess Parker

University of Montana

Table of Contents

Overview.....	3-4
Methods.....	4-5
Background on Missoula.....	5-6
International Example: The Republic of Ireland.....	6-12
Barriers from Retailers and Opposing Arguments.....	12-15
Application to Missoula and Recommendations.....	15-18
Appendix.....	19-23
Works Cited.....	24-26

Overview

Plastic bags have been in the media spotlight over the past several years due to their harmful environmental impact. Key issues include accumulating waste, effects on animal species, and litter pollution. Humans are producing an excess of 300 million tons of plastic every year, 50% of which are for single-use purposes (Plastic Oceans, n.d.). Americans throw away 100 million plastic bags annually with only 1% recycled by consumers (Fact Sheet: Single-Use Plastics, 2018). Landfills handle large amounts of bag waste due to the frequency of disposal and longevity of the product after it has been thrown away. Additionally, plastic bags negatively interfere with machinery in disposal areas and create time-consuming problems.

When no longer in use, plastic bags take between 400 and 1000 years to breakdown, and do not biodegrade via decomposition from bacteria or other living organisms (Aldred, 2008). Instead, the bags photodegrade, which makes them become smaller particles that pollute soil and water, therefore becoming a blight not only people but animals as well (Aldred, 2008). Animal species suffer from bags by becoming entangled or from eating them. Specifically, sea turtles cannot differentiate between floating plastic bags and jellyfish while feeding, resulting in illness or death for the vulnerable species. The visual pollution from the bags can be seen frequently in bodies of water, trees, roadside, and floating through the air. A shopping bag was found by scientists 36,000 feet deep inside the Mariana Trench (Grimes, 2019). All of the issues above are contributing for a call to action for their reduction or outright termination. Single-use plastics need to be discouraged from day-to-day use by the average consumer. The restriction or

elimination of their distribution will serve the health of the environment and allow for a decrease in waste, negative outcomes for wildlife, and visible litter.

The two main tactics in targeting the restriction of single-use plastic bags are fees and bans. A fee is a small monetary charge for plastic bags, meanwhile a ban eliminates thin plastic bags but still allows for thicker ones (Homonoff, 2017). Single-use plastic bags are public nuisance and negatively affect public health. This paper will explore barriers from stakeholders and implementation successes regarding single-use bag reduction policies. International, statewide, and local level single-use plastic bag bans and possibilities will be analyzed with relevance to existing barriers to implementation within the Missoula community from pertinent stakeholders.

Methods

The underlying motivation of the study was to help local leaders to identify barriers and opportunities within the community for a single-use plastic bag ban. Therefore, the aim of this applied research was to find useful arguments for implementing a ban in the City of Missoula by studying solutions in other areas. In order to guide the research and make it usable and relevant, several considerations went into the research process. Initially, research consisted of reviewing scholarly and popular literature about single-use plastic bag bans nationally and internationally. After an in-depth understanding of options was achieved, a conversation was conducted between local officials and the researcher about the current status of the bag ban in order to identify local issues. Following the conversation, additional research focused on specific concerns and barriers

from retailers and opposition. When all information was reviewed, it was analyzed and applied to Missoula in order to solve the current predicament of the lack of a bag ban.

Background on Missoula

As of fall of 2019, no ban exists for single-use plastic bags in the city of Missoula, Montana. The topic has been in the public conscience since what locals call “bagpocalypse” that took place in March of 2019. Plastic bags covered the hillside by the city dump and lined Interstate 90 due to high winds. Missoulians called on City Council members, the mayor and city staff to ban plastic bags in reaction to the littered landscape (Devlin, 2019). Although there was a public outcry, state legislature prevents any city in Montana from enacting a fee on bags (Devlin, 2019). Fees are a popular way to reduce single-use plastic bag use and are often placed on the consumer, therefore applying downward pressure. Senate Bill (SB) 121 argued for establishing a fee of 4 cents per disposable carryout bag used in any retail store and was heard by the Montana state panel in February of 2019, but was defeated 4-6 votes by the Senate Business, Labor and Economic Affairs Committee (Drake, 2019). Counter arguments included the expense of implementing a program and advocated for education, rather than a ban.

A state ban on plastic bag fees doesn’t necessarily mean that elimination or reduction is impossible. The city of Missoula is not explicitly banned from implementing an ordinance that can target single-use plastic bags. Ordinances are often used to address public health issues and allow for enforcement by the local government. Although from a state level, Montana can pass a pre-emption law, which allows for the higher level of state government to null the powers of the lower level city government. As observed in “bagpocalypse,” plastic bags are a public nuisance

and with their escape from the landfill pose a threat to the Missoula community in terms of health because of their impact on the environment.

The environmentally friendly culture in Missoula allows for a single-use plastic bag ban to be feasible. In August of 2018, the city adopted a Zero Waste Missoula plan. Zero waste is defined as: “The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health” (Zero Waste International Alliance, 2018). The goal is to move Missoula towards a 90% waste reduction by 2050. Outlined in the Zero Waste policy section is Objective D4. The goal of Action D4.1 is to “Restrict free distribution of single-use disposables” (Zero by Fifty: Missoula’s Pathway to Zero Waste, 2018). As of the status of Montana’s current legislation, that isn’t possible. D4.1 elaborates and includes the strategy to “Adopt ordinances that limit or ban sales or distribution of toxic and hard-to-recover products and product packaging such as plastic bags...” (Zero by Fifty: Missoula’s Pathway to Zero Waste, 2018). An ordinance without a fee is a feasible option. The adoption by the city of the Zero Waste plan sets a precedence of support for possible elimination.

International Example: The Republic of Ireland

Single-use plastic bag reduction or elimination strategies have been implemented in countries across the world due to the general consensus of the item’s negative impacts. Although bans exist, not all are created equally or are strictly enforced. The origin of action towards bags can come from a variety of sources: from the government, the business community, non-governmental agencies, or individual campaigning. Popular strategies include bans on plastics

according to thickness, voluntary schemes, promotion of alternative reusable bags, or levies (Convery, McDonnell & Ferreira, 2007). Some implementation strategies have been successful, in particular the strategy used in the Republic of Ireland. Ireland was chosen as an example in comparison to others because of the overall success of the strategy and depth of research conducted by implementers in order to understand relevant obstacles and opposition. The following case of Ireland's successful bag reductions have benefits that can be applied in the realm of public health and nuisance concerns, and concerns from stakeholders.

In March of 2002, the Republic of Ireland issued a valued-added tax (VAT) on individual plastic bags. The aims of the tax were to change consumer behavior and to reduce the presence of plastic bags in the rural landscape, due to their proliferation on coastlines and in the countryside, and increase public awareness of littering (Convery, McDonnell & Ferreira, 2007). The results of the "PlasTax" continues to be extremely successful. Originally, the fee per plastic bag was 15-euro cents but has been increased to 22-euro cents and is applied at the point of sale when the customer checks out at the register (Rosenthal, 2008). Because the tax is applied solely to the consumer, it does not affect competition and is therefore business friendly. The emphasis on the consumer allows for individual responsibility to be at play and gives them the choice to either pay or bring an alternative option. In order to inform consumers about the tax, the government issued an advertising awareness campaign that linked environmental benefits, such as the reduction of visible litter, along with the fee. The advertising campaign covered several different mediums. It ran on television for a month and included outdoor posters and leaflets which were provided to retailers that all highlighted the same message: that using free plastic

bags harm the environment (Environment Australia, 2002). Additionally, the timing was strategic for when the tax was introduced. Typically, the end of winter is when the landscape contains the greatest number of plastic bags and they become particularly visible (Anastasio & Nix, 2016). The season-relevant introduction allowed for the issue to already exist in the public eye, and therefore have more impact.

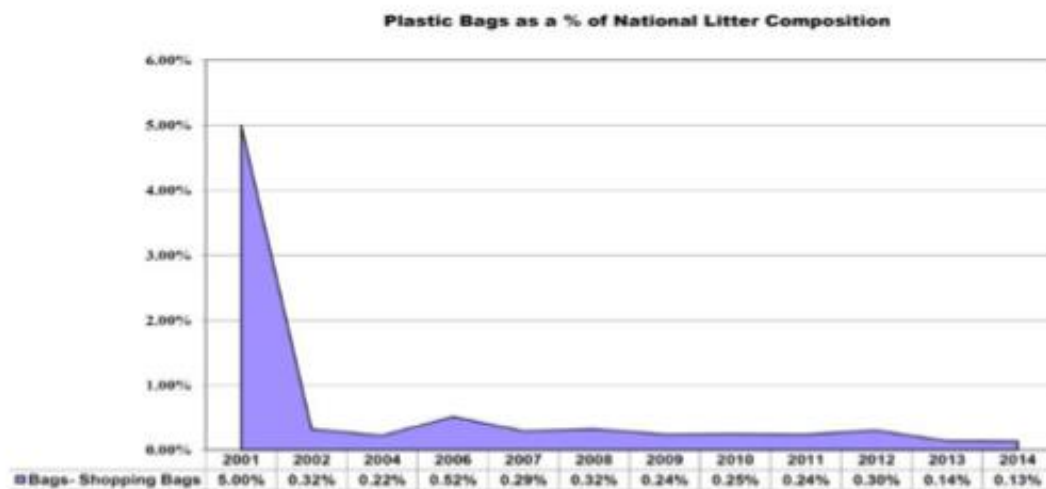
Concerns about the levy mainly came from retailers and butchers. Retailers voiced that they would face public backlash for “profiteering” and that shoplifting would increase because people could bring in their own bags (Convery, McDonnell & Ferreira, 2007). Arguments from butchers regarded sanitary issues that could come from an outright ban. The concerns were addressed by clearly stating the reason for the levy, e.g. not making a profit, and an exception was made for butchers for hygiene reasons. A survey was conducted regarding shoplifting after the implementation of the levy and data stated that for supermarkets shoplifting “rose initially then fell,” therefore not rendering permanent consequences (Convery, McDonnell & Ferreira, 2007). General counter arguments about plastic bag bans often include the subsequent increase of plastic materials after ban induction. In Ireland, retailers did report an increase as high as 77% increase in kitchen tidy bag sales but argue that this increase is not significant in the overall reduction of plastic shopping bags and in addition, larger garbage and garden bag sales have not shown any increase (Environment Australia, 2002).

The overall success of Ireland’s program can be observed in the decrease in usage of plastic bags, positive feedback from the public, and the reduction of litter throughout the countryside. Within weeks of implementation, bag usage dropped 94% and the trend to buy

reusable bags was picked up by consumers (Rosenthal, 2008). Revenues from the VAT have decreased after an initial upward trend as behavior has changed. One year after the levy was put into effect the Department of the Environment, Community and Local Government conducted a national survey (2003). According to the survey, “91% of the people interviewed were in favour of the levy, mentioning its positive impact on the environment and on the streets, and the positive use of reusable bags as reasons for its success. Only 6% were against, lamenting that they missed having plastic bags at home, and frustration when they forget their reusable bags” (Anastasio & Nix, 2016). Positive feedback can be attributed to the ability of the public to understand and accept the PlasTax. This success is a product of the education campaign that occurred prior to its implementation which in turn allowed retailers to face minimal customer resistance or lack of understanding (Environment Australia, 2002). Survey data for 2014 shows that plastic bags litter pollution decreased and is now down to a nominal figure: now it is only 0.13% compared to an estimated 5% prior to the implementation of the levy (Anastasio & Nix, 2016).

Although Missoula is prohibited from implementing any fee on single-use plastic bags, several takeaways can be derived from the Republic of Ireland example. Overall, the Republic of Ireland succeeded because of its identification of key stakeholders and addressing their complaints, educating stakeholders, creating a program that changes individual behavior, and cleaning up the litter-strewn landscape. Before trying to implement legislation, stakeholders were approached and their objections were accommodated within the ban, but no major sacrifices were made on the ban-supporting side. Specifically, the concerns voiced by retailers that shoplifting would increase were addressed by a post-implementation survey. A solution for

retailers concerned about an increase in theft could be for an employee to check receipts as customers leave the store, as already seen in businesses like Costco. Additionally, an exception for hygiene appeased other arguments from butchers. The interaction between stakeholders and government representatives was ongoing, which allowed for support to be gained rather than utilizing the element of surprise. Since the ban has been in place, it has gained incredible support from the Irish public and retail industry and it would be politically damaging to remove it (Convery, McDonnell & Ferreira, 2007). People have adjusted to the change and it has become a mundane part of daily life. The public concern about litter pollution has been alleviated through the reduction of debris. As pictured in the chart below, plastic bags have decreased from their original 5.00% of the litter composition in 2001 to 0.13% in 2014. The levy has allowed for 40 times less litter than there was before it was implemented (Anastasio & Nix, 2016). Litter surveys concluded that the number of areas in which there was no evidence of plastic bag litter increased by 21% in the span of a year, from 2002 to 2003, and areas without traces increased to 56% (Convery, McDonnell & Ferreira, 2007). As seen in the following chart,



the increase in clear areas allowed for a decrease in nuisance caused to the public. The reduction

in litter benefited the environment and the visual waste issue the Republic of Ireland was experiencing from plastic bags.

As observed in the success of the Republic of Ireland, it is possible to implement a single-use bag ban, but barriers still exist and must be addressed. In particular, concerns from retailers need to be taken into account because they are entities who supply the bags to consumers. Important considerations for dealing with retailers can be observed within the following data. A survey conducted by the Planet Ark Environmental Foundation (2005) targeted non-supermarket retail outlets in Australia (N-SR outlets) and their respective plastic bag use. Out of 202 N-SR outlets, 129 replied, and 96 completed the survey in full (Barclay, Dee, 2005). Statistics from the final report are as follows:

- 94 out of 129 retailer respondents (73%) said that they are offering plastic bag alternatives at the check-out.
- From the 35 retailers that do not provide any plastic bag alternatives for their customers, 51% of them stated that cost was the main reason for primarily using plastic bags, 46% said it was habit (i.e. “it’s just the way we have always done things”) and 43% said convenience was a reason why they currently primarily use plastic bags.
- 60% of retailers who gave away free plastic bags said they train staff to ask customers whether or not they would like a plastic bag with their purchase.
- 14% of the 35 retailers stated that having to order a minimum quantity of reusable bags was a reason for not stocking reusable bags. A similar number said their not knowing any reusable bag suppliers was another reason.

- The N-SR Sector is characterised by “impulse buying”. Thus, the likelihood of shoppers bringing a reusable bag is not as high as it is for supermarkets.

Barriers from Retailers and Opposing Arguments

Retailers under the 12,000 square-foot requirement could be influenced by the larger retailers through role model leadership. Within the study mentioned above (Barclay, Dee, 2005), the bag reduction successes by national chains have raised the bar. Locally in Missoula, retailers such as Costco, The Good Food Store, and Lucky’s Market already do not provide single-use plastic bags at checkout and can be an example to other retailers making the transition. The city of Missoula’s plastic bag ban would initially target retailers with store locations that are 12,000 square feet or more in size. The square-footage requirement would allow the ordinance to be applicable to non-grocery and grocery stores. Larger retailers are often already familiar to bans because of having stores in multiple locations that may or may not have bag bans already in place. Also, larger retailers have more resources to deal with possible costs and therefore it isn’t harmful to small, local businesses. Although some retailers may be familiar with bag ban initiatives, many come with concerns about how the ordinance would affect business practices. Common concerns include cost, convenience, and not understanding plastic bag alternatives.

Additional concerns can be applied to N-SR in Missoula and addressed. First, the issue of cost to retailers would be alleviated because they would no longer be required to supply free bags to customers. Also, extra storage room would become available without having to stock the item. The extra room could allow for the stocking of reusable bags. Reusable bags, such as cloth alternatives, etc. could be sold and allow a branding opportunity for the retailer. As the bag

continues to be reused by the consumer, brand recognition could increase. Education would be necessary for retailers to understand where they could find plastic bag alternatives, and the benefits of stocking and selling such items. The argument of habit and convenience can be addressed as seen in the change in behavior after the Republic of Ireland example. Both retailers and consumers alike adapted and changed their behavior, and now removing the ban would be damaging from public opinion (Convery, McDonnell, & Ferreira, 2007).

It is necessary to understand general opposition against single-use plastic bag bans, not only retailers, in order to prepare counter arguments. A main argument is the amount of greenhouse gases produced when making alternatives for the thin, single-use plastic bag. Another opposition argument states that with a ban, the purchase of plastic bags increases. Consumers are forced to purchase plastic bags that used to be offered for free and used as trash can liners with thicker alternatives. Lastly, some argue that bans affect low-income individuals because they no longer can receive free bags to carry out their items.

The argument that plastic consumption increases with single-use plastic bag bans stems from a report released in 2011 by the United Kingdom's Environment Agency. The report entails information regarding global warming impacts of grocery bags, varying from single-use options to reusables alternatives. According to the study (2011), "The paper, LDPE, non-woven PP and cotton bags should be reused at least 3, 4, 11 and 131 times respectively to ensure that they have lower global warming potential than conventional HDPE carrier bags that are not reused" (Edwards & Fry, 2011). In this context, HDPE means high-density polyethylene. The study (2011) also asserts that "Recycling or composting generally produce only a small reduction in global warming potential and abiotic depletion" (Edwards & Fry, 2011). Therefore, replacing

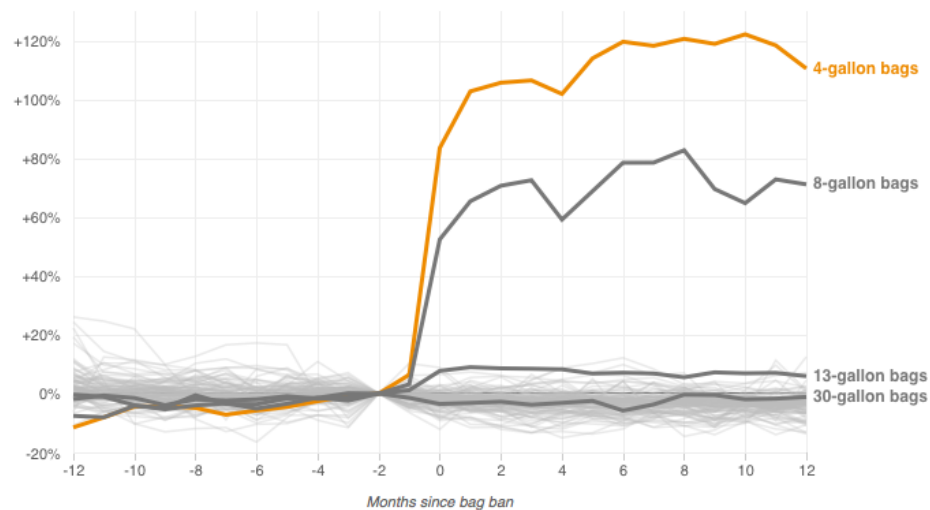
single-use HDPE bags with paper wouldn't necessarily allow for much of a positive change in terms of emissions. Advocating and educating consumers on a "bag for life" standpoint would allow for a negative correlation between global warming impacts and a reusable bag to eventually occur through long-term usage. From the public nuisance and health argument standpoint, global warming isn't a direct dissention, but is still a counter argument that cannot be ignored. A shift in consumer behavior towards "bag for life" actions would result in less roadside pollution and threat to disposal systems that single-use bags represent. Included in the Appendix are tables that break down bag alternatives and their environmental impacts.

Type of carrier	HDPE bag (No secondary reuse)	HDPE bag (40.3% reused as bin liners)	HDPE bag (100% reused as bin liners)	HDPE bag (Used 3 times)
Paper bag	3	4	7	9
LDPE bag	4	5	9	12
Non-woven PP bag	11	14	26	33
Cotton bag	131	173	327	393

Research was conducted in California after plastic shopping bags were banned statewide in 2016. Plastic waste decreased by 40 million fewer pounds per year, but people who used to reuse their shopping bags for other purposes had to now purchase bags so approximately 30 percent of the plastic that was eliminated by the ban came back in the form of thicker garbage bags (Rosalsky, 2019). Pictured below is the increase in purchase of 4-gallon and 8-gallon bags in California since the bag ban. The smaller sizes are typically used for dog waste disposal or lining trash bins. The behavior of buying thicker plastic bags to replace the single-use ones can be combated through educating consumers of viable alternatives, even one such as simple as not

using a trash can bin liner and rinsing it out every couple of weeks, or for dog waste using old bread bags (Rosalsky, 2019).

Trash Bag Sales Jumped After Grocery Bag Bans



The concern about negatives effects towards low-income individuals can be addressed by research conducted in Richmond, California. Instead of facing difficulties, behavior was adjusted accordingly, and customers of a discount grocery store increased their rate of bringing reusable bags or no bags at all by 48 percentage points (Homonoff, 2017). Also, air quality, and therefore public health, are improved by less accumulating waste and a decrease in disposal. Waste processing facilities are disproportionately located near low-income communities, these communities are affected the most due toxic byproducts in the air and water (Homonoff, 2017). An alternative could be to provide free paper or reusable bags to those enrolled in WIC/EBT programs. Low-income consumers can adapt their behavior and ultimately benefit from plastic bag reduction policies due to public health concerns.

Application to Missoula and Recommendations

In order to convince the city of Missoula to implement an ordinance regarding single-use plastic bags, environmentalists should use the communication technique of political advocacy. Advocacy campaigns can be defined as, "... a campaign [that] is waged to win a victory or bring about a concrete outcome and thus goes beyond simply questioning a policy" (Cox, 2006). The campaign must be centered around a specific purpose, have a target audience, a timeframe, and communication activities. For example: implementing a bag-ban citywide on retail locations with square-footage over 12,000 square feet, relevant retailers or environmentally conscious Missoulians, by 2021, and pamphlets, local news coverage, social media, etc.

A step-by-step process of developing a campaign can be observed in the following three questions. The first question is relevant to the objective and asks, "What exactly do you want to accomplish?" (Cox, 2006). Under the umbrella of that question exists the communication task of creating demand for solving the problem. Secondly, the focus shifts to the audience. It asks, "Which decision makers have the ability to respond, and what constituencies can hold these decision makers accountable?" (Cox, 2006). Supporters, dissenters, and undecided publics need to be identified. Necessary communication tasks in this phase include rallying individuals or businesses who support the single-use plastic bag ban and trying to convince others to support the campaign. Primary and secondary audiences need to be separated in this period. Primary audiences are defined as those who have the power to implement the campaign while secondary audiences include the general public, media, etc. (Cox, 2006). Last is the strategy portion of the campaign. It is necessary to ask, "What will persuade these decision makers to act on your objective?" (Cox, 2006). This is when the strategy to influence the primary audiences to put the objective into legislation comes into action.

Outside of the specific campaign framework there are several considerations when trying to implement an ordinance in the city of Missoula that can target single-use plastic bags. The ordinance itself should be clear and easy to understand. Businesses need to be held accountable if they do not comply. Enforcement tactics vary from warnings, fines, and extremities like revoking a business license. In general, all stakeholders must be identified, informed, and listened to if they express concerns or dissension. If approved, a detailed education, awareness, and outreach program designed to educate those affected should accompany the ordinance in order for understanding and acceptance to be established.

Retail stores over 12,000 square feet are the target of the single-use plastic bag ban and will need to be approached and educated on how the ban will affect business. Because there are already several large retailers in Missoula who do not provide plastic bags to customers at checkout, e.g. Costco, Lucky's Market, the Good Food Store, there are local examples to follow and can possibly facilitate the transition process. Several communication tactics can be applied in order to educate both retailers and consumers alike on proponents of a single-use bag ban. In regard to retailers, awareness for plastic bag alternatives, the process of implementation, and education can be achieved through simple communication materials such as pamphlets, a website, or ongoing newsletters so the businesses can stay up to date while the transition is in progress. Additionally, within the store, the business could set up a point-of-purchase display with branded bag alternatives located near the till for sell that have the opportunity to create brand awareness throughout the community. Retailers can justify their corporate social responsibility by becoming more environmentally friendly and market that to customers.

In regard to consumers, a broader campaign will be needed to educate Missoulians of the ordinance and benefits. Communication materials could include a public website, press releases

that could be picked up by the local news resulting in free coverage, an event such as a bag drive, locally targeted radio advertisements, or flyers located in affected locations. Planet Ark has a list of tips to help consumers adjust (See Appendix D). Timing of release of materials could be strategic and coincide with 2019's "bagopocalypse" incident, which prompted the initial complaint about single-use plastic bags in the first place.

Overall, the city of Missoula is not explicitly banned from implementing an ordinance and can target single-use plastic bags. The ordinance should be argued on the basis that plastic bags are a public nuisance and a health issue. The situation is already in the public eye due to their escape from the landfill as seen in "bagopocalypse." The environmentally friendly culture in Missoula allows for a single-use plastic bag ban to be feasible due to the city's adoption of a Zero Waste Missoula plan. Barriers need to be addressed, and all parties informed for support to be gathered from the Missoula community.

Appendix A (Edwards & Fry, 2011)**Table 4.3 – Assessment of Alternatives – 52 Shopping Trips per Year**

Alternative	Material Consumption (kg)	Litter (g)	Litter (m ²)	Litter (m ² /y)	Greenhouse (CO ² equiv)	Primary Energy Use (MJ)
Singlet HDPE	3.12	15.6	0.144	0.72	6.08	210
50% recycled singlet HDPE	3.12	15.6	0.144	0.72	4.79	117
Boutique LDPE (single use)	11.77	58.8	0.195	0.975	29.8	957
Reusable LDPE	0.96	4.8	0.0121	0.0603	2.43	78
Calico	1.14	5.7	0.0041	0.0819	2.52	160
Woven HDPE swag	0.22	1.1	0.00148	0.00743	0.628	18.6
PP fibre 'Green Bag'	0.48	2.4	0.00187	0.00934	1.96	46.3
Kraft paper – handled	22.15	111	0.156	0.078	11.8	721
Solid PP 'Smart Box'	0.42	NA	NA	NA	1.1	38.8
Biodegradable - starch based (Mater-Bi)	6.5	32.5	0.156	0.078	6.61 ¹	61.3

¹ – Assumed to break down into carbon dioxide

Appendix B (Edwards & Fry, 2011)

Table 4.5 – Cont.

Option	Economic Issues	Social Issues	Environmental Issues
Calico	<p>Bags are 100% imported</p> <p>Designed to be integrated with current retail system (to fit on bag hooks)</p> <p>Cost to consumers of purchasing bags - \$2 per bag, expected life of 1 year</p> <p>May slow down speed at checkout²⁰</p>	<p>Less convenient for consumers – need to bring own bags back to supermarket</p> <p>Reusable bags may have indirect impacts on behaviour (i.e. encourage consumers to be more waste wise in other aspects of daily life)</p> <p>Working conditions in overseas manufacturing a potential concern.</p>	<p>Cotton industry is a large user of water and chemicals (pesticides)</p> <p>Washing the bags consumes water, energy and detergents</p> <p>Reduces consumption (and therefore environmental impacts) of single use bags</p>
Woven HDPE Swag Bag	<p>Bags are imported</p> <p>May slow down speed at checkout²</p> <p>Cost to consumers of purchasing bags - \$4 per bag, expected life of 2 years</p>	<p>Less convenient for consumers – need to bring own bags back to supermarket</p> <p>Reusable bags may have indirect impacts on behaviour (i.e. encourage consumers to be more waste wise in other aspects of daily life)</p>	<p>Manufactured from non-renewable resources (oil or gas)</p> <p>Reduces consumption (and therefore environmental impacts) of single use bags</p>
PP Fibre 'Green Bag'	<p>Bags are imported</p> <p>May slow down speed at checkout²</p> <p>Cost to consumers of purchasing bags - \$3 per bag, expected life of 3 years</p>	<p>Less convenient for consumers – need to bring own bags back to supermarket</p> <p>Reusable bags may have indirect impacts on behaviour (i.e. encourage consumers to be more waste wise in other aspects of daily life)</p>	<p>Manufactured from non-renewable resources (oil or gas)</p> <p>Reduces consumption (and therefore environmental impacts) of single use bags</p>
Kraft paper – handled	<p>Bags are manufactured locally</p> <p>May slow down speed at checkout unless system is redesigned to accommodate them²</p>	<p>Primarily single use therefore requires minimal adjustment by consumers</p>	<p>Manufacture of paper consumes more water and generates more waterborne wastes</p> <p>Paper bags are 100% recyclable where paper collection is available</p>
Solid PP Smart Box	<p>Imported</p> <p>Cost to consumers of purchasing boxes - \$7 per box, expected life of 3 years</p> <p>Cost to retailers of buying trolleys to accommodate boxes, redesigning checkouts to accommodate boxes</p>	<p>Less convenient for consumers – need to bring boxes back to supermarket</p> <p>Awkward to carry long distances</p>	<p>Manufactured from non-renewable resources (oil or gas)</p> <p>Reduces consumption (and therefore environmental impacts) of single use bags</p> <p>Potentially recyclable at end of life but collection and disassembly system would need to be established</p>

Appendix B Continued (Edwards & Fry, 2011)**Table 4.5 – Cont.**

Option	Economic Issues	Social Issues	Environmental Issues
Biodegradable starch based	Bags are imported Bags are more expensive for retailers – estimated at 6 cents per bag	Primarily single use therefore requires no adjustment by consumers	Manufactured from renewable resources (e.g. corn, potato starch) Impacts of agriculture include water consumption, chemical use (fertilisers and pesticides), land degradation Bags will degrade in landfill but over a long period of time (due to lack of moisture & air) Reduced impact in litter due to rapid degradation in the open
Photo-degradable (PE with UV sensitive additives)	Bags are imported? Bags are more expensive for retailers – estimated at 6 cents per bag	Primarily single use therefore requires no adjustment by consumers	Manufactured from non-renewable resources (oil or gas) Same impact on solid waste in landfill as conventional bag Reduced impact in litter due to rapid degradation when exposed to sunlight
Biodegradable (PE with prodegradant additives)	Bags are imported? Bags are more expensive for retailers – estimated at 6 cents per bag	Primarily single use therefore requires no adjustment by consumers	Manufactured from non-renewable resources (oil or gas) Bags will degrade in landfill but over a long period of time (due to lack of moisture & air) Reduced impact in litter due to rapid degradation in the open

Appendix C (Edwards & Fry, 2011)

Table 4.5 – Triple Bottom Line Assessment

Option	Economic Issues	Social Issues	Environmental Issues
Singlet HDPE	<p>Well established market for supply of bags</p> <p>Current retail system and checkout design based on these bags</p> <p>Low cost to retailers and free to consumers</p> <p>~67% of bags imported</p>	<p>Convenient for consumers</p> <p>A proportion of consumers are concerned about environmental impacts</p>	<p>Manufactured from non-renewable resources (oil or gas)</p> <p>Prominent in litter stream (aesthetic impact)</p> <p>Potential hazard to wildlife</p> <p>Reused in the home for other applications (e.g. bin liners) – avoided impacts of other products</p>
50% Recycled singlet HDPE	<p>~67% of recycled bags imported</p> <p>No change required to retail systems or consumer behaviour</p>	<p>Just as convenient as virgin bags</p> <p>Partly addresses consumer concerns about environmental impacts</p> <p>No impact on overall consumption of bags</p>	<p>Life cycle environmental impacts reduced due to recycled content</p> <p>Provides a market for post industrial recycled HDPE</p> <p>Impacts on litter and wildlife the same as for virgin bags</p>
Boutique LDPE	<p>Well established market for supply of bags</p> <p>High percentage of bags manufactured locally</p> <p>Current retail system based on these bags</p> <p>Low cost to retailers</p>	<p>Convenient for consumers</p> <p>Marketing and branding for products</p> <p>A proportion of consumers are concerned about environmental impacts, but probably less than for singlet bags</p>	<p>Manufactured from non-renewable resources</p> <p>Less impact on litter and wildlife than singlet bags (heavier, generally disposed of in the home)</p> <p>Reused in the home for other applications (e.g. as a general bag)</p>

Appendix D (Barclay & Dee)

Here are some tips to help you adjust:

- Keep a set of reusable bags in your car.
- Keep your bags by the front door as a reminder to take them with you.
- Always start your shopping list with 'reusable bags'.
- Keep reusable bags in your backpack or handbag for spontaneous shopping.
- Remind friends and family to take their reusable bag if they are off to the shops.
- Keep the notepad where you write your shopping list inside reusable bags as a reminder to take them to the shops.
- Leave a bag or two at work for when you need to pick up lunch or do some lunch-time shopping.
- Use an old cardboard box or crate instead of a bag to transport your shopping.

Some Australians are concerned they might use extra plastic in the form of bin liners and pet poop bags where they previously reused shopping bags.

Here are some tips to reduce consumption of these products:

- Simply avoid using bin liners. Put your rubbish straight into the bin and wash the bin out every few weeks or when you feel the need.
- Purchase a home composter or **make your own** to dispose of food waste.
- Use newspaper or other scrap paper to line bathroom bins.
- Use empty bread bags to clean up dog droppings.

Works Cited

- Aldred, J. (2008, February 28). Q&A: Plastic bags. *The Guardian*. Retrieved from <https://www.theguardian.com/environment/2007/nov/13/plasticbags.pollution?gusrc=rss&feed=society>
- Anastasio, M. & Nix, J. (2016). Plastic Bag Levy in Ireland. *Institute for European Environmental Policy*. Retrieved from <https://ieep.eu/uploads/articles/attachments/0817a609-f2ed-4db0-8ae0-05f1d75fbaa4/IE%20Plastic%20Bag%20Levy%20final.pdf?v=63680923242>
- Barclay, V., & Dee, J. (2005). Plastic Check-out Bag Use in Non-supermarket Retail outlets. *Planet Ark Environmental Foundation*. Retrieved from <http://www.environment.gov.au/archive/settlements/publications/waste/plastic-bags/planet-ark/pubs/planet-ark.pdf>
- Brennan, C., MacLeod, C., & Ritch, E. (2009). Plastic bag politics: modifying consumer behavior for sustainable development. *International Journal of Consumer Studies*, (33), 2. doi:10.1111/j.1470-6431.2009.00749.x
- Convery, F., Ferreira, S., & McDonnell, S. The most popular tax in Europe? Lessons from the Irish plastic bags levy. *Environmental and Resource Economics*, 38(1), 1-11. Retrieved from SpringerLink.
- Cox, R. (2006). *Environmental Communication and the Public Sphere*. Thousand Oaks, California: Sage Publications, Inc.
- Devlin, S. (2019, April 15). City of Missoula studies potential ban on single-use plastic bags. *Missoula Current*. Retrieved from <https://www.missoulacurrent.com/outdoors/2019/04/missoula-plastic-bags/>
- Drake, P. (2019, February 7). Bills on straws, plastic bags tossed aside. *Great Falls Tribune*. Retrieved from <https://www.greatfallstribune.com/story/news/2019/02/07/montana-bills-straws-and-plastic-bags-die/2801918002/>

Edwards, C. & Fry, J. (2011). Life cycle assessment of supermarket carrier bags: a review of the bags

available in 2006. *Environment Agency*. Retrieved from

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291023/scho0711buan-e-e.pdf

Fact Sheet: Single-Use Plastics. (2018). *Earth day 2018: End plastic pollution*. Retrieved from

https://www.earthday.org/2018/03/29/fact-sheet-single-use-plastics/#_ftn7

Gibbens, S. (2019, May 13). Plastic proliferates at the bottom of the world's deepest ocean trench.

National Geographic. Retrieved from

<https://www.nationalgeographic.com/news/2018/05/plastic-bag-mariana-trench-pollution-science-spd/>

Homonoff, T. (2017). Scientific support for a plastic bag reduction law. *Scientist Action and Advocacy*

Network. Retrieved from https://scaan.net/docs/ScAAN_Bags_report.pdf

Plastic Shopping Bags – Analysis of Levies and Environmental Impacts. (2002). *Environment Australia:*

Department of the Environment and Heritage. Retrieved from

<http://www.environment.gov.au/archive/settlements/publications/waste/plastic-bags/pubs/analysis.pdf>

Rosalsky, G. (2019, April 29). Are Plastic Bag Bans Garbage? *Planet Money: NPR*. Retrieved from

<https://www.npr.org/sections/money/2019/04/09/711181385/are-plastic-bag-bans-garbage>

Rosenthal, E. (2008, January 31). By “bagging it,” Ireland rids itself of a plastic nuisance. *The New York*

Times. Retrieved from <https://www.nytimes.com/2008/01/31/world/europe/31iht-bags.4.9650382.html>

Taylor, L. (2018, June 29). Are you ready for the supermarket plastic bag ban? *Planet Ark News*.

Retrieved from <https://planetark.org/news/display/2492>

The Facts Are Overwhelming. (2019). *Plastic Oceans: The Facts*. Retrieved from

<https://plasticoceans.org/the-facts/>

Zero by Fifty: Missoula's Pathway to Zero Waste. (2018). *City of Missoula: Zero Waste Plan*. Retrieved from <http://www.ci.missoula.mt.us/DocumentCenter/View/46366/ZERO-by-FIFTY-PlanFinal>

Zero Waste Definition. (2018). *Zero Waste International Alliance*. Retrieved from <http://zwia.org/zero-waste-definition/>